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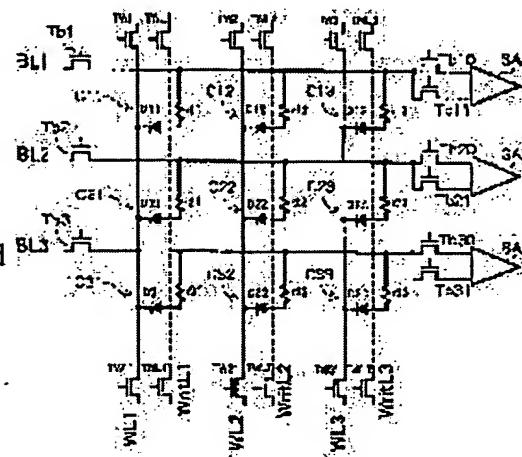
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## **(54) FERROMAGNETIC MATERIAL MEMORY AND OPERATION METHOD THEREOF**

### **(57)Abstract:**

**PROBLEM TO BE SOLVED:** To provide a memory structure and a driving method thereof, related to a matrix MRAM in which a cell area is small and a stored information is stably detected.

**SOLUTION:** A ferromagnetic material memory comprises bit lines BL1-3, variable resistors r11-13, 21-23, and 31-33 wherein an electric resistance value is selected by selecting magnetization direction of a ferromagnetic material, PN junction diodes D11-13, 21-23, and 31-33 connected in series to the variable resistors, and sense amplifiers SA1-3 connected to a prescribed bit line which, detect a bit line signal before and after inversion of the magnetization direction of the ferromagnetic material when reading. When reading the ferroelectric material memory, the electric resistance value of the variable resistor (r) is acquired to invert the magnetization direction of the ferroelectric material of a soft layer, and then the electric resistance value is acquired again. A signal detecting circuit SA compares the electric resistance values before and after inversion of the magnetization direction each other, and the information stored in a hard layer is discriminated, based on the comparison result.



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